CLAIMS

I claim:

39. A method of analysis comprising the steps of:

    (a) labeling molecules in a first sample with a first radioactive isotope;

    (b) labeling molecules in a second sample with a second radioactive isotope that is different from said first radioactive isotope; and

    (c) mixing said first sample and said second sample into a mixture.

40. The method of Claim 39 wherein:

    (a) said first radioactive isotope is tritium; and

    (b) said second radioactive isotope is carbon-14.

41. The method of Claim 39 wherein:

    (a) said first radioactive isotope is sulfur-35; and

    (b) said second radioactive isotope is carbon-14.

42. The method of Claim 39 wherein:

    (a) said first radioactive isotope is phosphorus-33; and

(b) said second radioactive isotope is phosphorus-32.

43. The method of Claim 39 further comprising the steps of:

(a) quantifying said first radioactive isotope in said mixture; and

(b) quantifying said second radioactive isotope in said mixture.

44. The method of Claim 39 wherein all said molecules are proteins.

45. The method of Claim 39 further comprising a step of contacting said mixture with an array.

46. The method of Claim 39 further comprising a step of separating said mixture into a plurality of groups of molecules.

47. The method of Claim 45 further comprising a step of quantifying said first radioactive isotope and said second radioactive isotope at a spot on said array.

48. The method of Claim 45 further comprising a step of applying a magnetic field to said array to improve the resolution of detected radiation.

49. The method of Claim 46 further comprising the steps of:

(a) quantifying said first radioactive isotope in each group of molecules; and

(b) quantifying said second radioactive isotope in each group of molecules.

50. The method of Claim 46 further comprising a step of quantifying a ratio of said first radioactive isotope to said second radioactive isotope for each group of molecules.

51. The method of Claim 49 further comprising a step of identifying a difference between said first sample and said second sample.

52. The method of Claim 49 wherein said first radioactive isotope and said second radioactive isotope are selectively quantified by exploiting the difference in half-life between said first radioactive isotope and said second radioactive isotope

53. The method of Claim 49 wherein said first radioactive isotope and said second radioactive isotope are selectively quantified by exploiting the difference in radiation energy between said first radioactive isotope and said second radioactive isotope.

54. The method of Claim 50 further comprising a step of identifying a group of molecules with a deviated ratio of said first radioactive isotope to said second radioactive isotope.

55. The method of Claim 53 wherein a screen is used to block higher proportion of radiation from said first radioactive isotope than radiation from said second radioactive isotope.

56. The method of Claim 53 wherein scintillation counting is used to selectively quantify said first radioactive isotope and said second radioactive isotope.

57. The method of Claim 54 further comprising a step of identifying a unique molecule responsible for causing said deviated ratio of said first radioactive isotope to said second radioactive isotope in said group of molecules.

58. A method for finding a difference between two samples comprising the steps of:

(a) labeling molecules in each sample with a unique radioactive isotope whereby one radioactive isotope is used per sample;

(b) mixing the labeled molecules from said two samples together into a mixture;

(c) contacting said mixture with an array;

(d) measuring the ratio of radioactive isotopes at a spot on said array.

59. The method of Claim 58 wherein said array is a nucleic acid array.

60. The method of Claim 58 wherein said array is a protein array.

61. The method of Claim 58 further comprising a step of applying a magnetic field to said array to improve the resolution of radiation signal.

62. The method of Claim 58 wherein said difference is a quantity of a unique molecule between said two samples.

63. The method of Claim 58 wherein said difference is a modification of a unique molecule

between said two samples.

64. The method of Claim 62 wherein said unique molecule is a protein.

65. The method of Claim 63 wherein said unique molecule is DNA and said modification is a methylation.

66. The method of Claim 63 wherein said unique molecule is a protein and said modification is a post-translational modification.

67. The method of Claim 66 wherein said post-translational modification is a phosphorylation.

68. The method of Claim 66 wherein said post-translational modification is a glycosylation.

69. The method of Claim 66 wherein said post-translational modification is a chemical modification.

70. A method for finding a difference between two samples comprising the steps of:

(a) labeling molecules in each sample with a unique radioactive isotope whereby one radioactive isotope is used per sample;

(b) mixing the labeled molecules from said two samples together into a mixture;

(c) separating said mixture into a plurality of fractions; and

(d) identifying a fraction with a deviated ratio of radioactive isotopes.

71. The method of Claim 70 wherein said difference is a quantity of a unique molecule between said two samples.

72. The method of Claim 70 wherein said difference is a modification of a unique molecule between said two samples.

73. The method of Claim 71 wherein said unique molecule is a protein.

74. The method of Claim 72 wherein said unique molecule is DNA and said modification is a methylation.

75. The method of Claim 72 wherein said unique molecule is a protein and said modification is a post-translational modification

76. The method of Claim 75 wherein said post-translational modification is a phosphorylation.

77. The method of Claim 75 wherein said post-translational modification is a glycosylation.

78. The method of Claim 75 wherein said post-translational modification is a chemical modification.